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PhD project: Climate change mitigation measures and restoration of benthic ecosystems affected by mussel aquaculture

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Summary: The largest mussel aquaculture in Europe is located along Galician Rías, which are affected by the North Canary Current upwelling allowing one of the highest primary production levels on the European coasts. This upwelling is subjected to alterations due to climate change and there is high fishing pressure in the area. Restoration of benthic ecosystem can increase the resilience of species of commercial interest and improve benthic community structure by increasing biodiversity, making the community more resilient to adverse conditions that may result from climate change. The main purposes of this thesis are: 1) Reduce the impact of mussel farming on benthic ecosystem by using nature-based solutions; 2) Promoting secondary production and recirculation of C, N and P to flow to higher trophic levels; 3) Increase the resilience of communities and populations of interest by improving the complexity and heterogeneity of benthic habitats; 4) Develop artificial structures in order to increase recruitment of invertebrate and fish populations of commercial interest affected by overfishing and climate change disturbances; 5) Analyse the possibilities of developing Integrated Multi-Trophic Aquaculture (IMTA) to promote the use of waste derived from mussel farming in European waters.

This thesis could develop a system that improves the resilience of benthic ecosystem to multiple stressors as well as enhance ecosystem services by increasing fisheries. Furthermore, mussel aquaculture management could become more efficient and sustainable.

